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3D PPM Simulations of Compressible Rayleigh-Taylor Instability and Turbulent Mixing* A. M. DIMITS, P. A. K. AMALA, R. H. COHEN, W. P. DANNEVIK, D. E. ELIASON, A. A. MIRIN, O. SCHILLING, *Lawrence Livermore National Laboratory*, D. H. PORTER, P. R. WOODWARD, *University of Minnesota* — We report the results of 3D piecewise-parabolic-method (PPM) simulations of compressible Rayleigh-Taylor instability and turbulent mixing, mostly for initial equilibria with a sharp density jump. The formation of bubbles and spikes, their subsequent growth and merging, and the evolution of the mean profiles towards a stably-stratified equilibrium are observed. We investigate (1) the dependence of mixing rates on the dimensionless physical parameters, (2) the effective Reynolds numbers at which convergence with respect to the spatial resolution is achieved, (3) whether PPM-Euler simulations reproduce fully-resolved Navier-Stokes simulations, and (4) relationships between averages of various products of the fluctuating fields that may suggest or test subgrid-scale models. Results for interfaces of finite width, smooth exponential inverted density profiles, and including ablation models will also be presented.
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